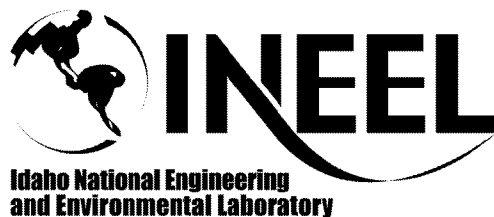


# Performance Specification

## Packaging Glovebox System Lift Table for the OU 7-10 Glovebox Excavator Method Project

Prepared for:  
U.S. Department of Energy  
Idaho Operations Office  
Idaho Falls, Idaho



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REVIEW AND APPROVAL SIGNATURES			
Denote R for review concurrence, A for approval, as appropriate.			
8. Type or Printed Name	9. R/A	9. Date	10. Organization/ Discipline
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## **1. SCOPE**

### **1.1 General**

This specification documents the requirements for design, fabrication, assembly, integration, testing, packaging, and shipping of the packaging glovebox system (PGS) lift table for the Operable Unit (OU) 7-10 Glovebox Excavator Method Project. The lift table is part of the project that will demonstrate the feasibility of waste retrieval and repackaging at OU 7-10 (Pit 9) within the Subsurface Disposal Area of the Radioactive Waste Management Complex at the Idaho National Engineering and Environmental Laboratory (INEEL) located near Idaho Falls, Idaho.

The lift table will be used to move standard 55- and 85-gal drums from the floor of the drum loadout enclosure up to the glovebox drum loadout stations. A turntable on the lift table will allow rotation of the drum. The drums will hold the repackaged waste that will be removed from OU 7-10.

### **1.2 Work Included**

The subcontractor shall provide all labor, material, equipment, and services necessary to design, fabricate, assemble, test, package, and deliver the quantity of lift tables, complete and in accordance with this specification, subject to terms and conditions of the contract or purchase order. The work includes, but is not limited to, the following:

- A. Design of the lift table
- B. Fabrication and assembly of the lift table
- C. Fabrication of the spacer-mounting base (if the subcontractor indicates that one will be required.)
- D. Performance of all inspections and testing as specified herein
- E. Preparation of installation, operation, and maintenance documentation as described herein
- F. Provision of all crates, skids, protective devices, lifting lugs, and materials used for shipping and handling to the INEEL
- G. Packaging and shipping of the lift table and associated hardware to the INEEL.

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### 1.3 Work Not Included

- A. Final installation of the lift table and integration with INEEL facility systems will be the responsibility of the INEEL management and operating contractor and is not within the scope of this specification.

## 2. APPLICABLE CODES, PROCEDURES, AND REFERENCES

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issue in effect on the date of invitation to bid shall apply. In the event of a conflict between the documents referenced herein and the contents of this specification, the contents of this specification shall be considered a superseding requirement.

### 2.1 National and Local Codes

Occupational Safety and Health Administration (OSHA) Code of Federal Regulations (CFR)

29 CFR 1910.212                      “Machinery and Machine Guarding—General Requirement for all Machines”

National Fire Protection Association (NFPA)

NFPA 70 through 99                      National Electric Code (ANSI 2001).

### 2.2 Industry Procedures

American National Standards Institute—Material Handling Institute

ANSI MH29.1                      “Safety Requirements for Industrial Scissor Lifts.”

## 3. SUBMITTALS

### 3.1 General

Vendor data shall be submitted as instruments of the subcontractor; therefore, before submittal, the subcontractor shall ascertain that material and equipment covered by the submittal and the contents of the submittal itself meet all the requirements of the subcontract specifications, drawings, and other contract documents.

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Each submittal shall contain identification for each separable and separate piece of material, equipment, and literature with respect to the information provided in the specification and on the Vendor Data Schedule. Submittals shall be numbered consecutively for each different submittal.

Vendor data required by this specification to support design, fabrication, testing, and shipment is identified on the Vendor Data Schedule. The Vendor Data Schedule provides a tabular listing by specification, reference, and description of the item or service. The type of submittal is identified by a vendor data code, and the time required to submit the item is identified by a when-to-submit code. An approval code specifies whether the submittal is for Mandatory Approval or for Information Only. One copy of routine paper or electronic file submittals is required; however, additional copies may be required by the Vendor Data Schedule. Note: Electronic file submittals are preferred.

All vendor data shall be submitted to the contractor using Form 431.13, "Construction Vendor Data Transmittal and Disposition Form." Form 431.13 provides the subcontractor with a convenient method to submit vendor data and provides the contractor with a means of dispositioning the submittal. The subcontractor shall list the Vendor Data Schedule item number, a vendor data transmittal tracking number (if applicable), specification number reference, a tag number (if applicable), the submittal status (e.g., mandatory approval, information only, resubmittal, or or-equal), the revision level, and the item description.

Comments by the contractor and required action by the subcontractor will be indicated by a disposition code on the submittal. The disposition codes will be classed as follows:

Work May Proceed: Submittals so noted will generally be classed as data that appears to be satisfactory without corrections.

Work May Proceed with Comments Incorporated. Revise Affected Sections and Resubmit: This category will cover data that, with the correction of comments noted or marked on the submittal, appear to be satisfactory and require no further review by the contractor before construction. Revised drawings shall be provided upon request.

Work May NOT Proceed. Revise and Resubmit: Submittals so dispositioned will require a corrected resubmittal and approval before proceeding with work for one of the following reasons:

1. Submittal requires corrections, in accordance with comments, before final review

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2. Submittal data are incomplete and require more detailed information before final review.
3. Submittal data do not meet subcontract document requirements.

Accepted for Use. Information Only Submittal: Submittals so dispositioned will generally be classified as Information Only for as-specified material and equipment.

Mandatory-Approval coded vendor data will be reviewed by the contractor and receive an A, B, or C disposition. Information Only submittals without comments will receive a D disposition. A-, B-, and C-coded dispositioned submittals will be returned to the subcontractor. Submittals dispositioned as D-coded will not be returned to the subcontractor. The contractor may provide internal review of Information Only submittals. In the event that comments are generated on an Information Only submittal, the submittal may be dispositioned B or C and be returned to the subcontractor for appropriate action. Acknowledgment of receipt of dispositioned vendor data by the subcontractor will not be required.

The contractor will return dispositioned submittals with reasonable promptness. The subcontractor shall note that a prompt review is dependent on timely and complete submittals in strict accordance with these instructions.

All vendor data must be dispositioned as A or D before the subcontract can be considered complete.

Where submittal of data items such as drawings, vendor data, and analysis, require approval or concurrence, the contractor will return such concurrence, corrections, or comments to the subcontractor within 5 working days after receipt of the submittal. Where corrections are required, the subcontractor shall submit corrected drawings, analysis, or other work, until approval is granted, at which time the contractor will return one approved and signed copy to the subcontractor. It is not the intent of the contractor to be obstructive, arbitrary, or capricious in reviewing data submittals, but to simply ensure compliance with the intent and requirements of this specification.

Contractor approval of drawings does not imply that the contractor accepts any responsibility for errors that may result in component reworks, schedule delays, or increased fabrication costs.



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### 3.2 Vendor Data Schedule

The following information shall be submitted by the subcontractor as indicated on the Vendor Data Schedule.

#### 3.2.1 Schedule

The subcontractor shall prepare a schedule 10 days after award of the subcontract identifying when the following action items will be completed: lift table design, fabrication, testing, packaging, and shipment to the INEEL. The fabrication schedule shall be provided to the contractor for approval in accordance with the Vendor Data Schedule. In addition, the subcontractor shall provide, for contractor approval, a revised schedule within 7 working days of any modification to the subcontract that revises the scheduled delivery date.

#### 3.2.2 Design Verification Documentation

Upon completion of the design, the subcontractor shall submit information that allows the contractor to verify that the design of the lift table meets the requirements of this specification. The information shall include as a minimum, overall configuration, design calculations, test procedure(s), and installation instructions.

It is preferred that all drawings submitted by the subcontractor be prepared using AutoCAD (Rev. 2002) or Mechanical Desktop (Rev. 6); however, the subcontractor may use any format that can be easily converted to the AutoCAD drawing format.

#### 3.2.3 Test Procedure

The subcontractor shall prepare and submit a procedure that documents the testing that will be performed to verify the operability of the lift table.

#### 3.2.4 Test Report

The subcontractor shall prepare and submit a report documenting the testing that was performed to verify the operability of the lift table. The report shall document the results of the tests.

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### 3.2.5 Assembly Drawings

The subcontractor shall prepare and submit assembly drawings that can be used during routine maintenance or repair of the lift table.

### 3.2.6 Installation Instructions

The subcontractor shall prepare and submit instructions that will allow the contractor to install the lift table.

### 3.2.7 Electrical Diagrams

The subcontractor shall prepare and submit electrical diagrams that can be used during routine maintenance or repair of the lift table.

### 3.2.8 Hydraulic Diagrams

The subcontractor shall prepare and submit hydraulic schematics (if hydraulics are used) that can be used during routine maintenance or repair of the lift table.

### 3.2.9 Operation and Maintenance Manual

The subcontractor shall prepare and submit a Lift Table Operation and Maintenance Manual.

### 3.2.10 Parts List

The subcontractor shall prepare and submit a parts list for the lift table.

### 3.2.11 Recommended Spare Parts

The subcontractor shall prepare and submit a list of suggested spare parts for the lift table. The spare parts list shall include cost of the parts for a given length of time and where the parts can be obtained if not from the subcontractor.

### 3.2.12 Special Tools List

The subcontractor shall prepare and submit a list of any special tools required for maintenance or repair of the lift table. The special tools list shall include cost of the tools for a given length of time and where the parts can be obtained if not from the subcontractor.

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## **4. DESIGN**

The lift table shall be designed in accordance with the following requirements (see Figure 1 for reference).

### **4.1 Pit Mounted**

The lift table shall be designed to be pit mounted. The inside pit dimensions are 40 in. long × 32 in. wide × 17 in. deep. The pits will be made using 3/16-in. carbon steel plate for the sides and bottom. The pits will be painted. No access exists under the pit enclosure.

The lift table shall be designed to fit inside the pit with a maximum gap between the pit wall and the lift table platform of 1/2 in. when the lift table is in the lowered position.

### **4.2 Travel**

The lift table vertical travel shall be 30 in. The subcontractor shall identify the lift speed options to the contractor based on the subcontractor's current design and experience in the proposal. The lift table will be used to place a drum into a loading ring and must be capable of relatively slow speed to allow correct drum placement and fit up. The initial estimate for the lift slow speed is between 20 and 30 in. per minute.

### **4.3 Turntable**

A turntable shall be mounted to the lift table platform. The turntable diameter shall be a minimum of 28 in. with a maximum of 30 in. The diameter of the turntable shall be selected by the subcontractor to best fit available hardware or design. The turntable shall be centered on the lift table platform. The turntable shall be hand operated.

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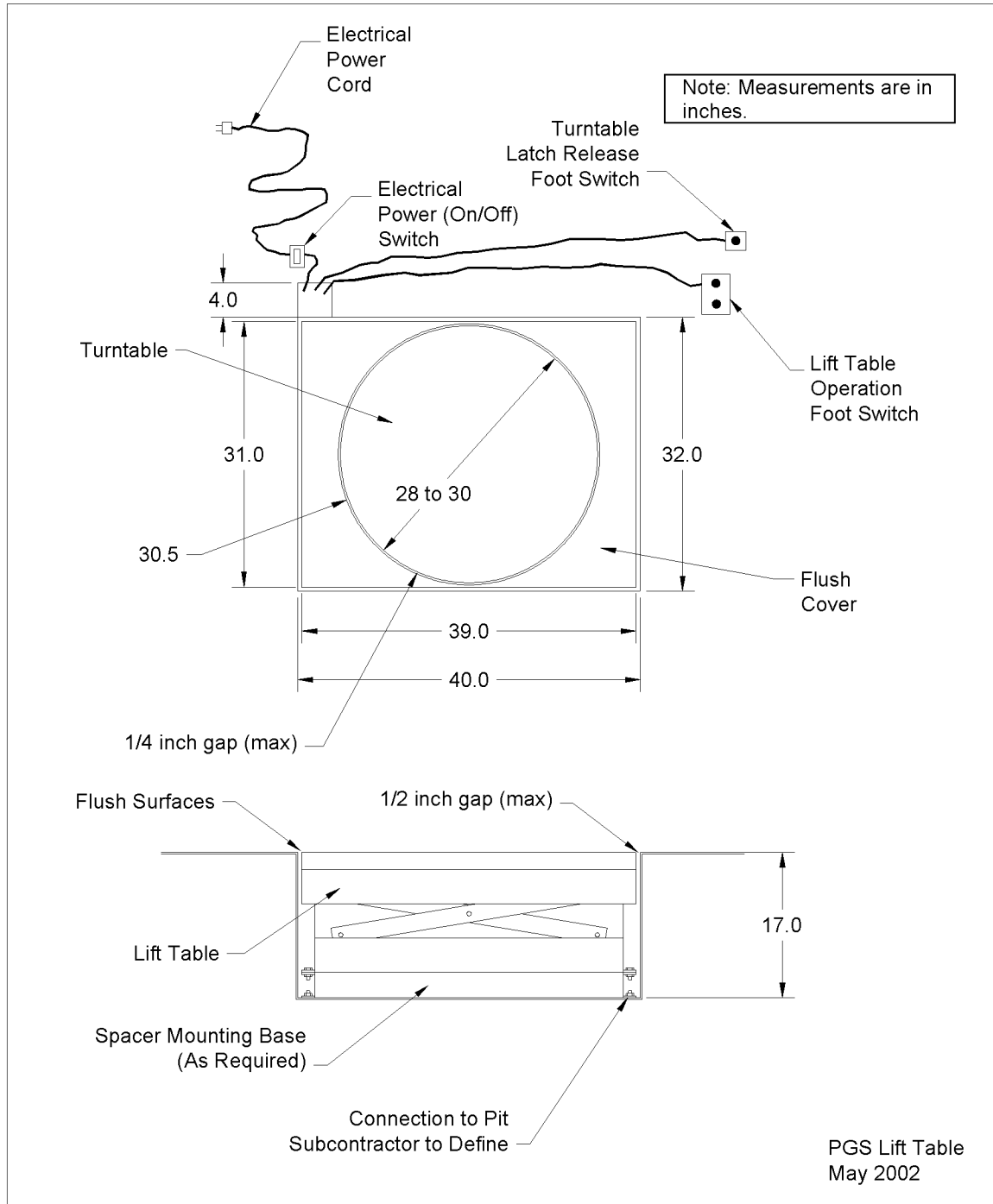


Figure 1. Diagram of OU 7-10 Glovebox Excavator Method Project lift table design.

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The turntable shall be designed with an electrically operated latching mechanism. When engaged, the latching mechanism will prevent the turntable from turning. The latching mechanism shall disengage when the electrical circuit is engaged. The latching mechanism shall be disengaged by a foot-operated switch box that can be placed on the floor next to the lift table. This will allow the operator to keep both hands on the drum when the turntable is disengaged. When the operator's foot is removed from the switch box the latching mechanism shall engage the turntable within 45 degrees of rotation.

#### **4.4 Flush Mount**

The turntable, when in the lowered position, shall be at the same elevation as the facility floor (flush). The area above the lift table platform around the turntable shall be filled in with a flush cover that is designed to bear the design load. This also may be accomplished by inseting the turntable into the lift table platform. The subcontractor shall decide how to achieve the flush-floor requirement. A maximum gap of 1/4 in. shall be allowed between the turntable and the flush cover or lift table platform.

#### **4.5 Capacity**

The lift table shall be designed to lift and lower a 1,000-lb load when the load is centered on the turntable. The lift table shall be designed to withstand a 1,500-lb load at the edge of the platform when in the lowered position.

Note: A drum transporter will be used to remove the drums from the lift table in the lowered position. The wheels on the drum transporter will be on the edge of the lift table during drum removal so the lift table will have to support a side load of up to 1,500 lb (weight of the loaded drum and the transporter) during drum removal.

#### **4.6 Load Table Drift**

The lift table shall indefinitely support a fully loaded drum (1,000 lb) with a maximum downward drift of 1/4 in. Note that this exceeds the requirements of the ANSI MH29.1 time limit of 20 minutes.

If the lift table cannot meet this requirement, then a mechanical support shall be provided that can be installed when the lift table is in the up position to prevent drifting.

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#### **4.7 Spacer Structure**

If the lift table does not require the entire depth of the pit to meet the flush requirement when in the completely lowered position, the subcontractor shall provide a spacer-mounting base to mount underneath the lift table to meet the flush-mount requirement.

#### **4.8 Actuation and Controls**

The lift table shall be powered using 110V single-phase power. All equipment required to operate the lift table shall be internally mounted within the envelope of the lowered lift table. The lift table shall be actuated using an electrically driven hydraulic or mechanical system. No pneumatic systems shall be used.

An on/off switch shall be provided that will be placed on the floor next to the lift table where the power cord enters the pit, as shown in Figure 1. The power cord shall be a minimum of 10 ft long after the on/off switch.

Electrically controlled foot switches shall be used to control the vertical movement of the lift table and the latching mechanism on the turntable. The foot switch cords shall be a minimum of 8 ft long. The foot switches shall be designed to prevent inadvertent use (i.e., a cover over the switch or some other means of protection). The electrical connection shall be a standard three-prong plug.

An adjustable upward travel limit switch shall be incorporated into the lift table.

#### **4.9 Safety**

The lift table shall, as a minimum, meet the requirements of 29 CFR 1910.212 and ANSI MH29.1. Beveled-edged toe guards or electronic toe sensors shall be incorporated.

#### **4.10 Bellows**

A bellows or skirt shall extend with the platform. The design shall permit air to flow into the area behind the bellows to prevent damage or collapse.

#### **4.11 Pit Interface**

Lifting connections shall be installed on the lift table to allow it to be placed into the pit. A method to allow the lift table to be connected to the pit shall be identified by the subcontractor. This may include a removable platform or access holes through the platform to allow access to the pit connection hardware.

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#### **4.12 Fire Safety**

The hydraulic fluid shall be Factory Mutual Approved "Less Flammable" in accordance with Factory Mutual Global Property Loss Prevention Data Sheet 7-98, "Hydraulic Fluids," in accordance with *Architectural Engineering Standards* (DOE-ID 2001).

#### **4.13 Miscellaneous**

The lift table shall be painted using the manufacturer's standard paint.

### **5. MANUFACTURING AND ASSEMBLY**

#### **5.1 General**

The lift table shall be assembled in the subcontractor's shop to assure proper fits and operation. The assembled lift table shall be placed into an enclosure simulating the pit and verified to operate in accordance with the requirements of this specification.

The contractor's technical representative or designated alternate shall inspect the operation of the assembled final product before shipment to the INEEL.

#### **5.2 Materials**

The lift table shall be manufactured using materials as specified by the subcontractor to meet the performance requirements of this specification.

#### **5.3 Cleaning, Painting, and Coating**

The lift table shall be prepared and painted as specified by the subcontractor. The subcontractor shall define the available paint colors to the contractor. The contractor shall determine the color during design verification review.

#### **5.4 Spare Parts**

No spare parts shall be included in the proposal, only the identification of recommended spares and the associated cost.

### **6. QUALITY ASSURANCE**

#### **6.1 Program**

The lift table shall be manufactured in accordance with the subcontractor's quality program requirements.

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## 6.2 Nondestructive Examination

All nondestructive examination shall be in accordance with the subcontractor's requirements.

## 6.3 Operational Testing

Operational testing on the lift table shall be performed by the subcontractor before shipment to the INEEL.

## 6.4 Inspection

The lift table shall be subjected to a visual or mechanical inspection to verify compliance with the requirements. This includes appropriate inspections or tests to verify compliance with this specification.

### 6.4.1 Operability Tests

The subcontractor shall plan and perform operability tests on the lift table to verify compliance to the requirements of this specification.

### 6.4.2 Drum Lift-Load Test

The subcontractor shall plan and perform a load test on the lift table. The lift table shall be load tested to 1,250 lb (-5%, +0%). The test load shall be rotated at the full UP, full DOWN, and at three intermediary positions of approximately 25% of the stroke of travel. The loaded platform shall be tested to verify that the platform remains at the positions of 25, 50, 75, and 100% of travel for 20 minutes. Measurements shall be made at the beginning and at the end of the 20-minute time interval to measure vertical drift. The measured elevation change shall not exceed 0.5% (0.15 in.) during the 20-minute interval. If the elevation drift exceeds the allowable limit, the lift platform shall be repaired and retested as necessary.

The vertical drift of the table shall be tested in the 100% position after 2 hours. No more than 1/4 in. of drift is allowable. If the table drift exceeds the allowable distance, the mechanical support (see Section 4.6) shall be employed to prevent drift.

After completion of the load test, all load-bearing members of the lift platform shall be visually inspected to verify that no part subject to wear or distortion has been adversely affected by the load test.



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## 7. PACKAGING AND SHIPPING

### 7.1 Packing and Packaging

The subcontractor shall provide adequate protection for shipping the fabricated components to the INEEL without damage. Particular care shall be exercised to ensure that the surface finish, cleanliness, dimensional stability, and overall integrity of the equipment achieved during fabrication are not impaired during shipment.

### 7.2 Marking and Handling

Crates shall be marked with the contract number, the actual weight of the loaded crate, the assembly orientation in the crate, and the contents of the crate. Bulky items or pallets requiring movement by forklift or crane shall have the weight conspicuously identified or labeled. Handling and storage instructions shall be permanently marked on or attached to the shipping crate.

### 7.3 Special Transportation Requirements

The subcontractor is responsible for all necessary packaging and shipping. The subcontractor shall notify the contractor of the method of shipment, waybill number, pick-up date, and other relevant information immediately following delivery to or pick-up by the shipper. An itemized packing list shall accompany the shipment.

## 8. REFERENCES

29 CFR 1910.212, 2002, Title 29, "Labor," Part," Part 1910, "Machinery and Machine Guarding, Subpart 212, "General Requirement for all Machines," *Code of Federal Regulations*, Office of the Federal Register.

ANSI, 2001, *2002 National Electric Code*, ANSI/NFPA.70 2002, American National Standards Institute, National Fire Protection Association, September 1, 2001.

ANSI MH29.1, 1994, "Safety Requirements for Industrial Scissor Lifts," American National Standards Institute Material Handling Institute.

DOE-ID, 2001, *Architectural Engineering Standards*, Rev. 28, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho,  
URL: <http://www.inel.gov/publicdocuments/doe/archeng-standards/default.shtml>.